

## CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

### **LISTING OF CLAIMS**

1. (Previously Presented) A communications system comprising:

a stratospheric platform having a payload controller and a phased array antenna having a plurality of elements for generating a first beam and a second beam; and

a gateway station in communication with said stratospheric platform, said gateway station receiving a first signal having the first beam having interference from the second beam therein and receiving a second signal having the second beam having interference from the first beam therein,

said gateway station comprising a first subtracting block for subtracting said second signal from said first signal to obtain the first beam;

said gateway station comprising a second subtracting block for subtracting said first signal from said second signal to obtain the second beam.

2. (Previously Presented) A communications system as recited in claim 1 wherein said gateway station weights said second signal with a first weight prior to subtracting said second signal from said first signal.

3. (Previously Presented) A communications system as recited in claim 1 wherein said gateway station weights said first signal with a second weight prior to subtracting said second signal from said first signal.

4. (Previously Presented) A communications system as recited in claim 1 wherein said first weight is a function of user position files.
5. (Original) A communications system as recited in claim 1, wherein the payload controller comprises a demultiplexer for receiving control signals.
6. (Previously Presented) A communications system as recited in claim 5, wherein the demultiplexer generates a plurality of element control signals.
7. (Previously Presented) A communications system as recited in claim 6, wherein the element control signals are coupled to an RF feed, and the RF feed is coupled to said plurality of elements of said phased array antenna.
8. (Previously Presented) A communications system as recited in claim 1, wherein the gateway station comprises a beam generator for generating beam signals.
9. (Previously Presented) A communications system as recited in claim 1, wherein said gateway station further comprises a multiplexer/demultiplexer.
10. (Previously Presented) A communications system as recited in claim 9, wherein said multiplexer/demultiplexer comprises a code division multiplexer/demultiplexer.

11. (Previously Presented) A communications system as recited in claim 1, wherein said gateway station is coupled to a terrestrial network.

12. (Previously Presented) A system as recited in claim 11, wherein said terrestrial network comprises an Internet.

13. (Previously Presented) A system as recited in claim 11, wherein the terrestrial network comprises a public service telephone network.

14. (Previously Presented) A method of controlling a communications system having a stratospheric platform, said method comprising the steps of:

receiving a first signal having a first beam having interference from a second beam therein at a gateway station;

receiving a second signal having a second beam having interference from the first beam therein at the gateway station,

subtracting said second signal from said first signal to obtain the first beam; and

subtracting said first signal from said second signal to obtain the second beam.

15. (Previously Presented) A method as recited in claim 14, further comprising, prior to the steps of receiving, generating the first beam and the second beam using a payload controller and a phased array antenna having a plurality of elements therefore; and wherein prior to the step of subtracting said second signal from the first signal, weighting the second signal

with a first weight, and prior to the step of subtracting said first signal from said second signal, weighting the first signal with a second weight.

16. (Previously Presented) A method as recited in claim 15, further comprising:

performing said step of subtracting said second signal from said first signal to obtain the first beam in a first subtracting block in the gateway station; and

performing said step of subtracting said first signal from said second signal to obtain the second beam in a second subtracting block in the gateway station.

17. (Previously Presented) A method as recited in claim 15 wherein said first weight and said second weight are a function of user position files.

18. (Previously Presented) A method of controlling a communications system having a stratospheric platform, said method comprising the steps of:

receiving a first signal having a first beam having interference from a second beam therein at a gateway station;

receiving a second signal having the second beam having interference from the first beam therein at the gateway station,

weighting said first signal with a first weight to provide a weighted first signal;

weighting said second signal with a second weight to provide a weighted second signal;

subtracting said weighted second signal from said first signal to obtain the first beam; and

subtracting said weighted second signal from said second signal to obtain the second beam.

19. (Previously Presented) A method as recited in claim 18 wherein said first weight and said second weight are a function of user position files.

20. (Previously Presented) In a communication system having a gateway station for processing signals to and from a plurality of users, a method of canceling interference at the gateway station, comprising:

receiving a plurality of signals, each from one of the plurality of users, at least one of said plurality of signals having interference therein from at least one other of said plurality of signals;

determining an amount of interference from user position files;

canceling the interference in said at least one of said plurality of signals by subtracting said at least one other of said plurality of signals.

21. (Previously Presented) A method as recited in claim 20, wherein, prior to the step of canceling, said at least one other of said plurality of signals is weighted.

22. (Previously Presented) A method as recited in claim 21, wherein said at least one signal is associated with a mobile user.

23. (Previously Presented) A method as recited in claim 22, wherein said at least one other of said plurality of signals is associated with a mobile user.

24. (Previously Presented) A communications system as recited in claim 23, wherein said second weight is a function of user position files.

25. (Previously Presented) A communications system comprising:

a stratospheric platform having a payload controller and an antenna having a plurality of elements for generating a first beam and a second beam;

a gateway station in communication with said stratospheric platform, said gateway station receiving a first signal having the first beam having interference from the second beam therein and receiving a second signal having the second beam having interference from the first beam therein,

said gateway station weighing said second signal with a first weight to form a weighted second signal, and thereafter, said gateway station comprising a first subtracting block subtracting said second weighted signal from said first signal to obtain the first beam, wherein said first weight is a function of user position files;

said gateway station comprising a second subtracting block for subtracting said first signal from said second signal to obtain the second beam.

26. (Previously Presented) A communications system comprising:

a stratospheric platform having a payload controller and an antenna having a plurality of elements for generating a first beam and a second beam;

a gateway station in communication with said stratospheric platform, said gateway station receiving a first signal having the first beam having interference from the second beam therein

and receiving a second signal having the second beam having interference from the first beam therein,

said gateway station weighing said second signal with a first weight to form a weighted second signal, and thereafter, said gateway station comprising a first subtracting block subtracting said second weighted signal from said first signal to obtain the first beam;

said gateway station weighing said first signal with a second weight to form a first weighted signal, said gateway station comprising a second subtracting block for subtracting said first weighted signal from said second signal to obtain the second beam, said first weight and the second weight being a function of user position files.